Dorsal Penile Nerve Block During Newborn Circumcision: Underutilization Of A Proven Technique?

William L. Toffler, M.D., Ann E. Sinclair, M.S., and Keith A. White, M.D.

***Abstract*: Newborn circumcision is the most common surgical procedure in the United States. The technique for local anesthesia, dorsal penile nerve block (DPNB), was first described in 1978. Although multiple subsequent studies have reported that DPNB can relieve pain and stress during a newborn's circumcision without any additional morbidity, many practitioners do not employ this technique. A survey of randomly selected active members of the Oregon Academy of Family Physicians evaluated their perception and use of DPNB. One hundred members were contacted, and 96 responded. Only 36 percent of those physicians performing circumcision used DPNB in circumcisions. The most common reasons given for not employing DPNB were a lack of awareness of the technique (31 percent), believing that pain response in circumcision was not significant (29 percent), and concern about risks (27 percent). The median effectiveness rate reported by those using the block was 70 percent. The majority of respondents were interested in the results of the survey as well as in more information regarding the technique.**

We believe further educational efforts are indicated to increase awareness and use of DPNB in performing circumcisions in the newborn. Because there is significant variation in the effect achieved, some instruction in appropriate technique also is needed as part of this educational effort. (J Am Board Fam Pract 1990; 3:171-4.)

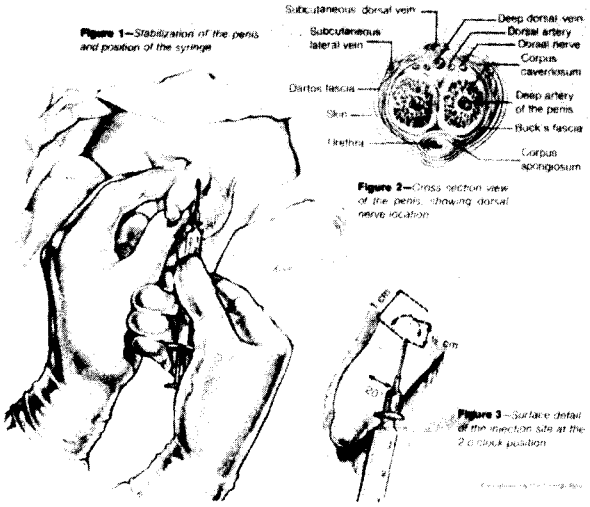
In 1975, the American Academy of Pediatrics reaffirmed its previous position that there were no clear medical indications for routine newborn circumcisions.[1] Although there has been a subsequent decline in the number of circumcisions, each year the procedure is performed on more than one million newborns.[2] Despite a slight downward trend, newborn circumcision remains the most common surgical procedure in the United States.[3]

There is recent evidence from a large study done at the Brook Army Medical Center that shows that there is a higher rate of urinary tract infection in uncircumcised men.[4] The merits of circumcision have been debated for decades, and the controversy appears to be no less today.

Because circumcisions are still requested for the majority (59 percent) of newborn boys nationwide, it seems prudent to make every attempt to optimize one's technique in performing the procedure (unpublished special tabulation from the Hospital Discharge Survey, 1979–1987, National Center for Health Statistics). In 1978, Kirya and Werthmann developed a local anesthetic technique for newborn circumcision called the dorsal penile nerve block (DPNB).[5] The technique for DPNB is shown in Figures 1–3. Kirya and Werthmann reported that infants who received the DPNB seemed quieter, although there was no control group. Since that time, there have been numerous controlled studies showing significantly less stress as measured by transcutaneous oxygen pressures, less crying time, and smaller increases in heart rate in infants receiving an anesthetic versus those who did not.[6-9] The number of infants included in these studies has been relatively small, and none has evaluated how different physician groups (family physicians, pediatricians, obstetricians) have utilized this technique.

Behavioral effects from circumcision, with and without anesthesia, also have been evaluated. Dixon and her colleagues reported that infants receiving lidocaine in a dorsal penile nerve block were more attentive to animate and inanimate stimuli following circumcision and had a greater

From the Department of Family Medicine, The Oregon Health Sciences University, Portland. Address reprint requests to William L. Toffler, M.D., Department of Family Medicine, Oregon Health Sciences University, 3181 S.W. Sam Jackson Park Road, Portland, OR 97201.



Figures 1–3. Dorsal penile nerve block. Used with permission from Williamson PS. Neonatal circumcision: why and how to use a local anesthetic. Consultant 1984; 24:70.

ability to quiet themselves when disturbed.[10] Moreover, motor behaviors were delayed in the unanesthetized group. The behavioral differences were still evident the day following the procedure.

The only complication reported with DPNB thus far has been local hematoma at the site of the injection.[5-9] Serum levels of lidocaine were significantly less than the levels found in a newborn whose mother had been given epidural lidocaine for Cesarian section.[10]

Despite the growing body of evidence suggesting that local anesthesia can relieve pain and stress during a newborn's circumcision without any additional morbidity, it was our perception that few practitioners routinely employ this technique. For this reason, we randomly surveyed family practitioners in Oregon to determine their perception of DPNB and the frequency with which they used it when performing newborn circumcisions.

Method

One hundred members of the Oregon Academy of Family Physicians (OAFP), a statewide organization of approximately 500 physicians, were selected by applying a random number generator to the active membership list. Physicians were mailed a questionnaire with a cover letter explaining the study and a postpaid return envelope. Two weeks later, a follow-up letter, a second questionnaire, and a postpaid return envelope were sent to all who had not responded. One week after that, nonresponders were interviewed by telephone if they were willing.

Results

Of the 100 potential respondents who were contacted, 96 participated in the study. Their median year of graduation from medical school was 1971; the range was from 1943 to 1983. Prior residency training was not queried.

Seventy-two respondents (75 percent) reported that they performed circumcisions on newborn boys; 23 (24 percent) did not. One did not answer the question. Of the 72 who performed circumcisions, 45 (63 percent) replied "no" to the question "Do you ever use local anesthetics?" and 26 (36 percent) responded "yes." One did not respond.

The 45 physicians who performed circumcision without a local anesthetic were asked to select from a number of plausible reasons for not using it. The following figures were reported:

- 14 (31 percent) were not aware of the technique
- 7 (16 percent) were aware of the technique but had not tried it yet
- 13 (29 percent) were aware of the technique but believed that the pain response was not significant
- 12 (27 percent) were aware of the technique but concerned about the risk
- 6 (13 percent) had tried the anesthetic and thought it was not effective
- 5 (11 percent) had tried it and believed it was too troublesome
- 5 (11 percent) cited other reasons

Of the 26 physicians who performed circumcisions with a local anesthetic, 16 (60 percent) said they used it 100 percent of the time. The mean response to the question, "In what percentage of your circumcisions do you use local anesthetic?" was 77.7 percent (range, 5 percent–100 percent). When asked, "In what percentage does the block seem to be effective in decreasing pain response?" the median was 70 percent (range, 0 percent–100 percent).

Discussion

This study confirmed our impression that a minority of physicians used local anesthesia to per-

form newborn circumcisions; only 26 (36 percent) of 72 physicians did so. Furthermore, only 16 (60 percent) of 26 always used the technique.

Of those who performed circumcision without local anesthesia, 14 (31 percent) had never heard about the technique. Because the technique was first described 10 years ago, it is puzzling that there is such a lag time between the publication of new information and the achievement of widespread physician awareness.

Almost one-third (29 percent) of the physicians who did not use local anesthesia judged the pain response to be insignificant. In addition to the work described earlier, the presence and significance of the pain response in the neonate have been very well discussed by Anand and Hickey.[11] They concluded that current knowledge suggests that humane considerations should apply as forcefully to the care of neonates and young, nonverbal infants as they do to children and adults. Their article received significant media coverage, and the public is more aware that some physicians may ignore iatrogenic pain in the neonate. Those who casually dismiss the pain response as insignificant may risk alienating parents sensitized to this issue.

Our study found that usage was not consistent even among physicians who employed local anesthesia in performing circumcision. Only 16 of 26 reported that they used local anesthesia 100 percent of the time. Moreover, physicians who used anesthetic perceived it to be effective in decreasing the response of the newborn to pain an average of 60 percent of the time (range, 0 to 100 percent). This discrepancy might be explained by perceptual differences or by actual variation in technique by individual physicians. Because our study was dependent on subjective data provided by participants, we cannot evaluate the relative importance of variables, although differences in technique can account for relative success in achieving the desired anesthetic effect.

One important discovery of the study was the high physician interest in more information about the use of local anesthesia in circumcision. Fifty-two (54 percent) wanted more information, including 19 (37 percent) who already used anesthesia. We sent them copies of abstracts of relevant articles, which allowed the survey itself to become a means of education. Although the impact of this single mailing cannot be measured, interest among physicians in expanding their knowledge and awareness is clearly present. In fact, one physician wrote that a journal club in her hospital studied the material in our mailing, and she described her personal success with changing her circumcision technique to include local anesthesia. Because the sampling of family physicians was limited to members of the Oregon Academy of Family Physicians, the results of this survey might not be representative of all family physicians in the United States.

Conclusion

A minority of family physicians in Oregon who performed newborn circumcision used local anesthesia. Apart from the slight increase in time and the small cost of a local anesthetic, there are no other significant difficulties in employing this technique. Because many physicians either are unaware of the technique or believe the pain response is not significant, we believe that further educational efforts are indicated to increase awareness and use of a local anesthetic in performing circumcisions in the newborn. Some effort to teach appropriate technique may need to be a part of this educational effort.

References

1. Thompson HC, King LR, Knox E, Korones SB. Report on the ad hoc task force on circumcision. Pediatrics 1975; 56:610-1.
2. Wallerstein E. Circumcision: an American health fallacy. New York: Springer Publishing Company, 1980:216.
3. Grimes DA. Routine circumcision of the newborn infant: a reappraisal. Am J Obstet Gynecol 1978; 130:125-9.
4. Wiswell TE, Roscelli JD. Corroborative evidence for the decreased incidence of urinary tract infection in circumcised male infants. Pediatrics 1986; 78:96-9.
5. Kirya C, Werthmann MW Jr. Neonatal circumcision and penile dorsal nerve block – a painless procedure. J Pediatr 1978; 96:998-1000.
6. Williamson PS, Williamsom ML. Physiologic stress reduction by a local anesthetic during newborn circumcision. Pediatrics 1983; 71:36-40.
7. Holve RL, Bromberger PJ, Groveman HD, et al. Regional anesthesia during newborn circumcision: effect on infant pain response. Clinical Pediatr 1983; 22:813-8.

8. Rawlings DJ, Miller PA, Engel RR. The effect of circumcision on transcutaneous PO_2 in term infants. Am J Dis Child 1980; 134:676-8.
9. Maxwell LG, Yaster M, Wetzel RC, Niebyl JR. Penile nerve block for newborn circumcision. Obstet Gynecol 1987; 70:415-9.
10. Dixon S, Snyder J, Holve RL, Bromberger PJ. Behavioral effects of circumcision with and without anesthesia. J Dev Behav Pediatr 1984; 5:246-50.
11. Anand KJ, Hickey PR. Pain and its effects on the human neonate and fetus. N Engl J Med 1987; 317:1321-9.

American Board of Family Practice Certification/Recertification Examination Dates

July 12, 1991
July 10, 1992
July 9, 1993
July 8, 1994
July 14, 1995